Story from the front lines
A woman in her 70s was seen in the emergency room for chest pain. She had a history of pulmonary embolism that was diagnosed 4 months prior and treated at another hospital. Given a history of medication non-adherence and alcohol abuse, it was decided that anticoagulation was too high risk for her, so an IVC filter had been placed as her only therapy. Since that time, she had had ongoing pleuritic chest pain. She hadn’t seen her son in several years, and finally came to visit him in Denver. She mentioned her chest pain and how it was bothering her, so her son brought her to the emergency room. Her son said, “there are so many advances in medicine today, I thought there was surely something we could do about this chest pain.” Her chest pain was unchanged from the time of her PE, was pleuritic, right sided, non-radiating, worse with lying flat, improved with activity and was not associated with shortness of breath, diaphoresis, nausea or any other symptoms. She had normal vital signs and a normal physical exam other than obesity. An EKG was normal in the setting of active pain. Her labs showed a mild anemia, but a normal basic metabolic panel and negative troponin. The physician sent her to the observation unit for “very-low risk chest pain” which, at some hospitals may mean an additional 4-6 hours in the ER waiting for a repeat troponin-I. Her second troponin was negative and she was discharged home without further evaluation of her chest pain.

Teachable moment
More than 8 millions patients visit the emergency room each year for chest pain or other symptoms associated with an acute coronary syndrome (ACS). ACS was the issue of concern for this and for many similar patients. Approximately 2% of acute coronary syndromes are missed and discharged from the emergency room (in 2000), which increases morbidity and mortality. It is a great clinical conundrum how to reduce that 2% risk without a huge cost burden to the healthcare system and without causing harm to patients including prolonged time in the hospital, additional labs draws, possible radiation and even the possibility of invasive angiography. Many approaches, risk scores and technologies have been developed to address this issue. This patient met the American Heart Association criteria for low risk chest pain. She was being kept in the ER only for a repeat troponin-I. Troponin-I is released in the setting of myocardial necrosis and an abnormal level can be detected in the blood 3-4 hours after the onset of myocardial injury. Thus, the time-course of chest pain is important in the interpretation of the abnormal level. Our patient had chest pain for 4 months without a specific change or worsening of the quality of her chest pain. Her pre-test probability of ACS was already low given the chronicity of her pain, the quality of her pain and her normal EKG. Thus, a single was troponin-I was likely sufficient to rule-out acute MI. However, because of the very low risk of a missed MI, most society recommendations still recommend a repeat troponin. More sensitive biomarkers are being developed to expedite this process and reduce length of stay and potential harms to the patient. A single high-sensitivity troponin-T in conjunction with a non-ischemic EKG has recently been shown to be a
reliable negative predictor of MI and death from MI at 30 days with negative predictive values of 99.8% (95% CI 99.7-99.9) and 100% (95% CI 99.9-100) respectively.\textsuperscript{4} Hopefully, in the future, these sensitive tests will reduce cost and potential harm to such patients.


